
Navigation Improvement Study
Reconnaissance Report

New London Harbor Connecticut



**US Army Corps
of Engineers**
New England Division

JUN 1988

REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188	
<small>Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.</small>				
1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE June 1988		3. REPORT TYPE AND DATES COVERED Reconnaissance Report
4. TITLE AND SUBTITLE Reconnaissance Report, Proposed Breakwater Construction New London Harbor, New London, Connecticut				5. FUNDING NUMBERS
6. AUTHOR(S) U.S. Army Corps of Engineers New England Division				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) U.S. Army Corps of Engineers, New England Division 424 Trapelo Road Waltham, MA 02254-9149				8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) U.S. Army Corps of Engineers, New England Division 424 Trapelo Road Waltham, MA 02254-9149				10. SPONSORING / MONITORING AGENCY REPORT NUMBER
11. SUPPLEMENTARY NOTES This Reconnaissance Report for New London Harbor in New London, Connecticut was prepared under the authority of Section 107 of the 1960 Rivers and Harbor Act, as amended, for Small Navigation Projects.				
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release Distribution is unlimited				12b. DISTRIBUTION CODE
13. ABSTRACT (Maximum 200 words) This report examined the feasibility of constructing a breakwater to protect the area along the Inner Harbor between Shaw's Cove and the City Pier from wave damage caused by the wakes of large vessels, as well as southerly winds. Both cellular sheet pile and rubble-mound breakwater alternatives were examined. The least expensive of the two types of breakwaters considered for this project was the rubble-mound breakwater alternative. It's cost was estimated at \$10,546,000, representing an annual cost of \$949,000, which outweighed the annual benefit of \$199,000 to be derived from its construction. Therefore, the project, with a benefit to cost ratio of 0.21 is not recommended for further study. This report consists of a Main Report which summarizes the existing conditions, the opportunities for improvement, the rationale for plan formulation, the design and cost estimates, and the cost-benefit analysis, as well as, the supporting documentation for Economic Analysis, Environmental Analysis and Pertinent Correspondence.				
14. SUBJECT TERMS New London Harbor; breakwaters; Shaw's Cove; City Pier				15. NUMBER OF PAGES 38
				16. PRICE CODE
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT	

GENERAL INSTRUCTIONS FOR COMPLETING SF 298

The Report Documentation Page (RDP) is used in announcing and cataloging reports. It is important that this information be consistent with the rest of the report, particularly the cover and title page. Instructions for filling in each block of the form follow. It is important to stay within the lines to meet optical scanning requirements.

Block 1. Agency Use Only (Leave blank).

Block 2. Report Date. Full publication date including day, month, and year, if available (e.g. 1 Jan 88). Must cite at least the year.

Block 3. Type of Report and Dates Covered. State whether report is interim, final, etc. if applicable, enter inclusive report dates (e.g. 10 Jun 87 - 30 Jun 88).

Block 4. Title and Subtitle. A title is taken from the part of the report that provides the most meaningful and complete information. When a report is prepared in more than one volume, repeat the primary title, add volume number, and include subtitle for the specific volume. On classified documents enter the title classification in parentheses.

Block 5. Funding Numbers. To include contract and grant numbers; may include program element number(s), project number(s), task number(s), and work unit number(s). Use the following labels:

C - Contract	PR - Project
G - Grant	TA - Task
PE - Program Element	WU - Work Unit Accession No.

Block 6. Author(s). Name(s) of person(s) responsible for writing the report, performing the research, or credited with the content of the report. If editor or compiler, this should follow the name(s).

Block 7. Performing Organization Name(s) and Address(es). Self-explanatory.

Block 8. Performing Organization Report Number. Enter the unique alphanumeric report number(s) assigned by the organization performing the report.

Block 9. Sponsoring/Monitoring Agency Name(s) and Address(es). Self-explanatory.

Block 10. Sponsoring/Monitoring Agency Report Number. (If known)

Block 11. Supplementary Notes. Enter information not included elsewhere such as: Prepared in cooperation with....; Trans. of....; To be published in.... When a report is revised, include a statement whether the new report supersedes or supplements the older report.

Block 12a. Distribution/Availability Statement. Denotes public availability or limitations. Cite any availability to the public. Enter additional limitations or special markings in all capitals (e.g. NOFORN, REL, ITAR).

DOD - See DoDD 5230.24, "Distribution Statements on Technical Documents."
DOE - See authorities.
NASA - See Handbook NHB 2200.2.
NTIS - Leave blank.

Block 12b. Distribution Code.

DOD - Leave blank.
DOE - Enter DOE distribution categories from the Standard Distribution for Unclassified Scientific and Technical Reports.
NASA - Leave blank.
NTIS - Leave blank.

Block 13. Abstract. Include a brief (Maximum 200 words) factual summary of the most significant information contained in the report.

Block 14. Subject Terms. Keywords or phrases identifying major subjects in the report.

Block 15. Number of Pages. Enter the total number of pages.

Block 16. Price Code. Enter appropriate price code (NTIS only).

Blocks 17. - 19. Security Classifications. Self-explanatory. Enter U.S. Security Classification in accordance with U.S. Security Regulations (i.e., UNCLASSIFIED). If form contains classified information, stamp classification on the top and bottom of the page.

Block 20. Limitation of Abstract. This block must be completed to assign a limitation to the abstract. Enter either UL (unlimited) or SAR (same as report). An entry in this block is necessary if the abstract is to be limited. If blank, the abstract is assumed to be unlimited.

RECONNAISSANCE REPORT

PROPOSED BREAKWATER CONSTRUCTION

NEW LONDON HARBOR

NEW LONDON, CONNECTICUT

PLAN FORMULATION

Prepared by:

Christine Johnson

Project Manager

April 1988

DESIGN AND COST ESTIMATES

Prepared by:

Peter Williams

Civil Engineer

January 1988

EXISTING CONDITIONS

General Information

The city of New London is located in southeastern Connecticut, and is situated along the lower west banks of the Thames River. New London Harbor comprises the lower four miles of the Thames River from the Gold Star Memorial Bridge to Long Island Sound (see Figure 1).

New London Harbor is a major harbor servicing the Groton Nuclear Submarine Center of the United States Navy and the United States Coast Guard Academy upstream of the Gold Star Memorial Bridge, as well as, the United States Navy Underwater Systems Laboratory and the Groton General Dynamics Ship Yard downstream of the bridge. In addition, the Connecticut State Pier and the Central Vermont Railroad Pier are also located in New London Harbor.

The existing Federal project in New London Harbor consists of a channel 40 feet deep and generally 600 feet wide which runs from Long Island Sound 3.8 miles to the State Pier. Also, a channel 13 feet deep, and 400 feet in width skirts, the waterfront of the city. In addition, two branch channels 23 feet deep, exist in Winthrop Cove and in between the State Pier and the Central Vermont Railroad Pier (see Figure 1). The Thames River Federal navigation project extends upstream of the Gold Star Bridge providing deep-water access to the submarine center and small craft access further upriver to Norwich.

Project Area Description

The project area is located between Shaw's Cove and City Pier in the northwestern section of New London Harbor (see Figure 2). As can be seen in Figure 2, at the present time, a Coast Guard Pier, Fisher's Island Ferry Pier and City Pier all exist within the project area. In addition, the city of New London is in the process of developing plans for the construction of a marina in the area between the Railroad bridge at the entrance to Shaw's Cove and the Fisher's Island Ferry Pier. Tentative plans call for docking facilities and moorings capable of housing 40 commercial vessels and 460 recreational vessels.

Problems and Without Project Condition

Excessive wave activity exists within the project area. These waves are the result of the wakes of large vessels continuously navigating the channels of New London Harbor. In addition, the project area is completely unprotected from the substantial wave heights caused by southerly gales and hurricanes.

Some problems caused by this numerous wave activity include:

- 1) Hull chipping.
- 2) Pier damage.
- 3) Vessel Collisions due to limited space while berthed at piers.
- 4) Unloading delays/both cargo and passenger.
- 5) Moving vessels upriver during storms.

The without project condition is assumed to be a continuation of the above problems.



View to Southwest towards New London's downtown area -
Shaw's Cove to City Pier



View to Northwest - U.S. Navy Underwater Systems Labora-
tory in foreground, Thames River in background

AERIAL PHOTOGRAPHS

NEW LONDON HARBOR
NEW LONDON, CONNECTICUT

Photos taken November, 1985
by Mark Habel, NED

FIGURE 2

OPPORTUNITIES FOR IMPROVEMENT

Plan Formulation Rationale

All of the problems described above could be reduced or eliminated by the construction of a protective structure. Conceptual ideas were discussed with local officials, and it was agreed that a breakwater structure offshore of the project area would provide optimum protection to the area.

Due to the network of channels existing within New London Harbor, the only available area upon which to build the breakwater was that area between the 40-foot wide, 23-foot channel on the west side of New London Harbor and the main 600-foot wide, 40-foot channel on the east side (see Figure 3). Because the breakwater would be constructed in such a congested area, it was agreed that lighted navigation aids would also be required, possibly at both ends of the breakwater.

BREAKWATER ALTERNATIVES

Considered Alternatives

Both rubble-mound and cellular sheet pile type breakwaters were considered. Both structures were designed to provide adequate protection to vessels berthed at piers and moorings from vessel wakes and from waves caused by southerly winds. Providing full protection during hurricane force storms was considered cost prohibitive.

As can be seen in Figure 3, both designs incorporate identical layouts. The proposed project would be constructed in the irregularly shaped area between the two existing channels and would extend northeast 1600' from the vicinity of Shaw's Cove to City Pier.

Cost of Alternatives

A wave height analysis resulted in a rubble-mound design with the cross-sectional dimensions shown in Figure 4A. The cost estimates of this alternative may be seen in Table 1. The estimates reflect January 1988 price levels for typical structures of this type.

A cross-section of the cellular sheetpile design may be seen in Figure 4B. The cost estimates for this structure may be seen in Table 2. These prices also reflect January 1988 price levels.

Annual costs for both designs are shown in Table 3. It may be seen that the rubble-mound alternative, with an annual cost of \$949,000 is approximately 20% less expensive than the cellular sheetpile alternative, with an annual cost of \$1,173,000.

BENEFIT COST ANALYSIS

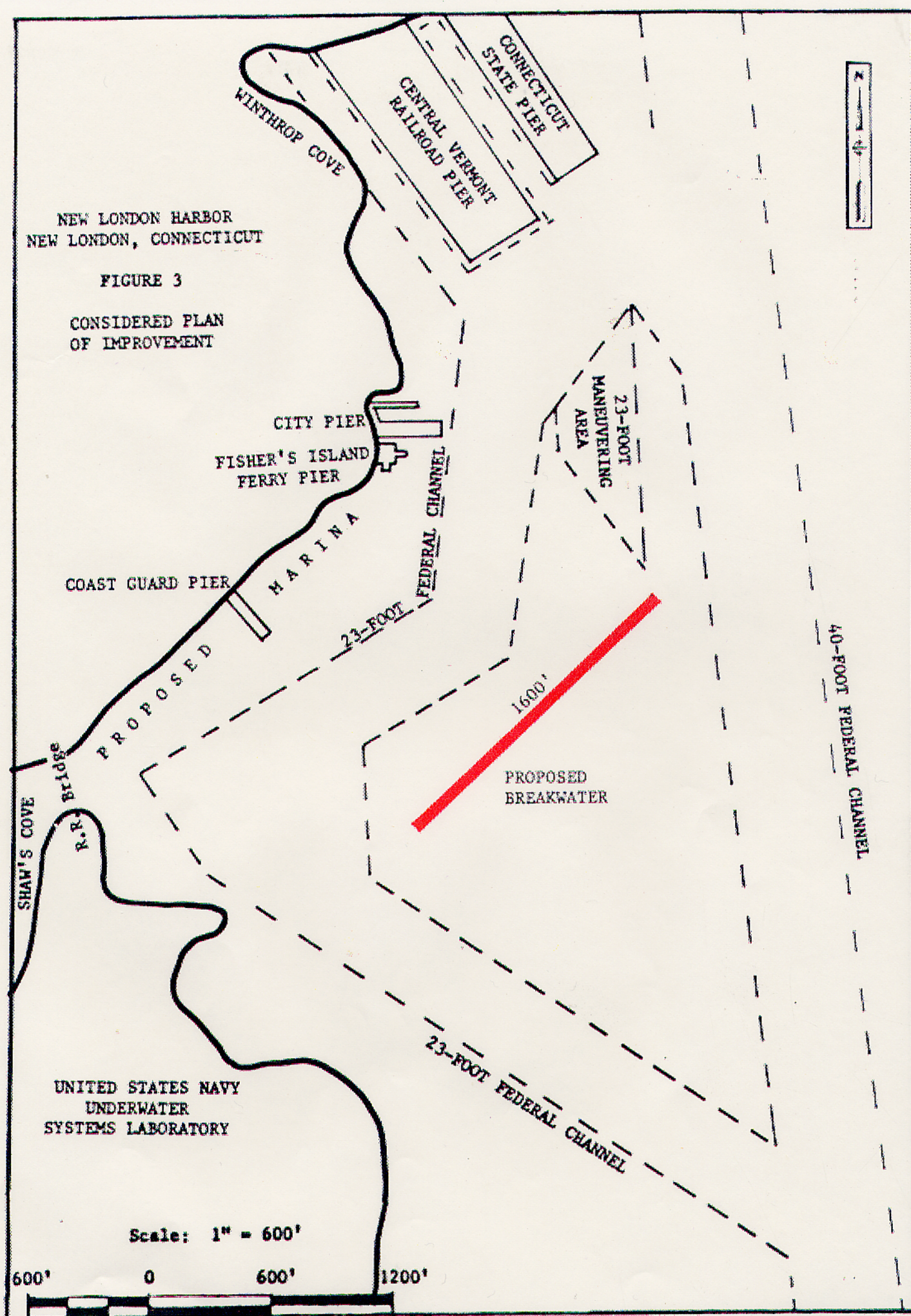
Annual Benefits

Assuming the breakwaters were in place, benefits include reduced damages to vessels docked at piers, and to piers themselves. Additional benefits from reduced fuel and labor costs caused by unloading delays and movement of vessels upriver during storms are also claimed.

NEW LONDON HARBOR
NEW LONDON, CONNECTICUT

FIGURE 3

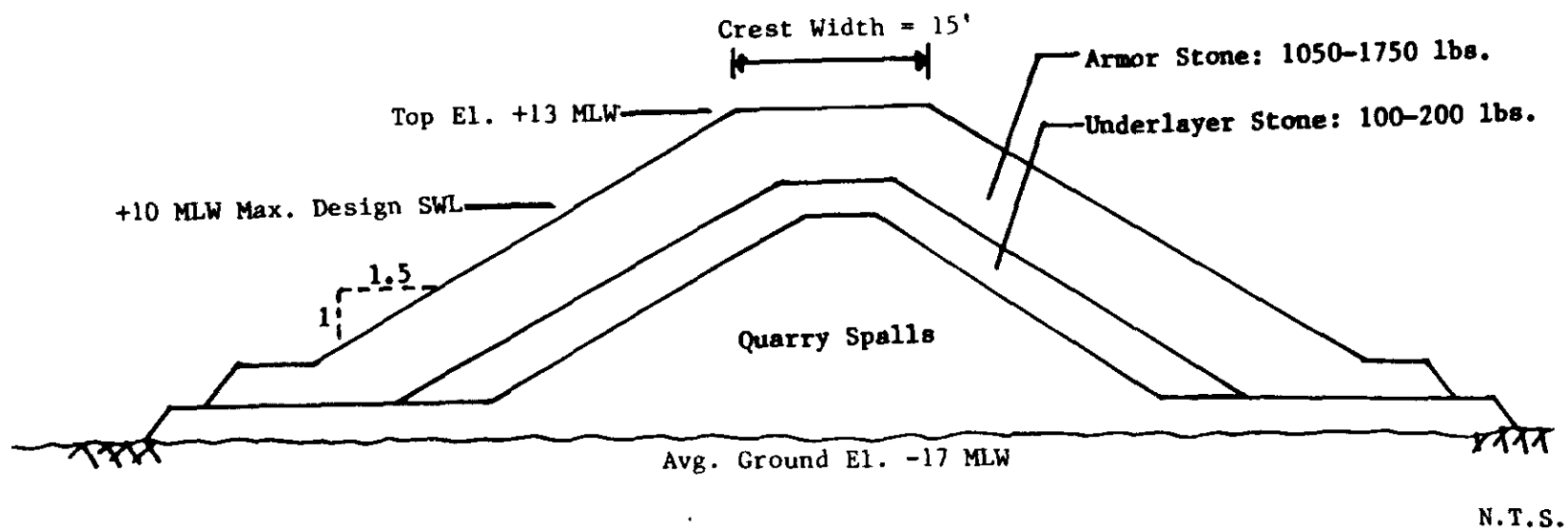
CONSIDERED PLAN
OF IMPROVEMENT



UNITED STATES NAVY
UNDERWATER
SYSTEMS LABORATORY

Scale: 1" = 600'

600' 0 600' 1200'



RUBBLE-MOUND BREAKWATER DESIGN

NEW LONDON HARBOR
NEW LONDON, CONNECTICUT

FIGURE 4A

TABLE 1

NEW LONDON HARBOR

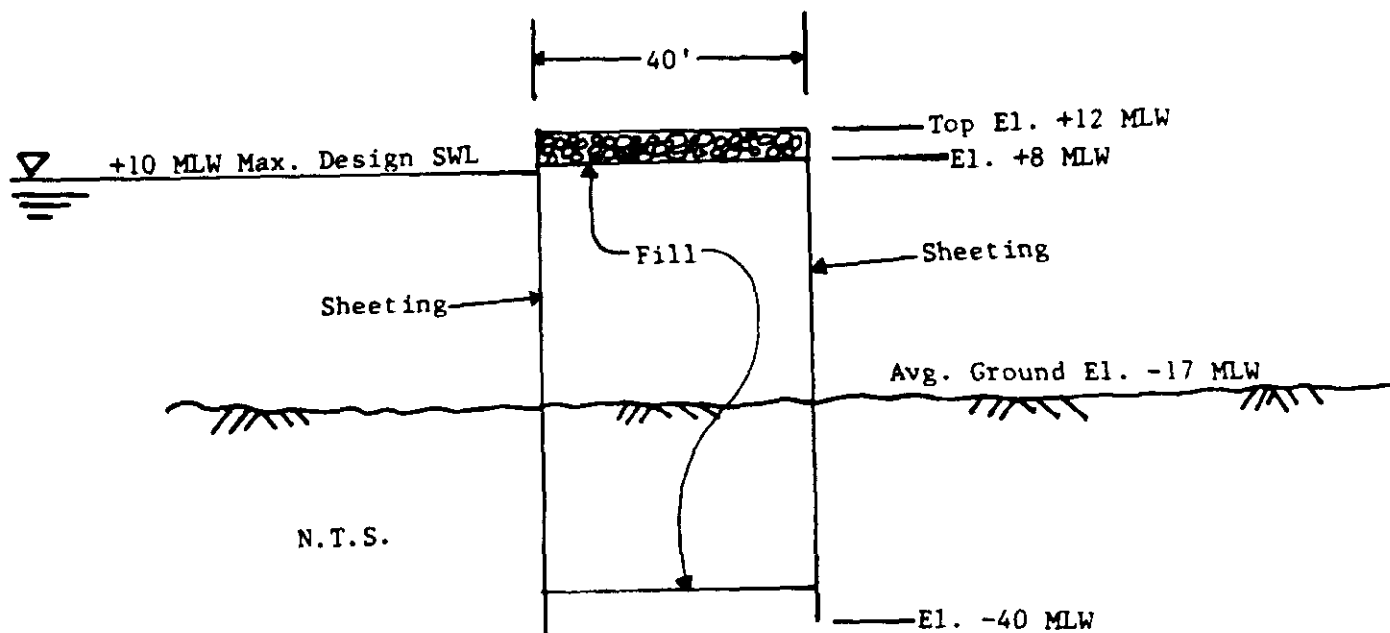
RUBBLE-MOUND BREAKWATER DESIGN

COST ESTIMATES

<u>ITEM</u>	<u>QUANTITY</u>	<u>UNITS</u>	<u>UNIT PRICE(1)</u>	<u>TOTAL COST(2)</u>
Mobilization/Demob.	1	1s	\$60,000	\$ 60,000
Stone Protection	42,200	cy	\$45	\$ 1,899,000
Core Stone	84,400	cy	\$30	\$ 2,532,000
Dredging	123,900	cy	\$10	\$ 1,239,000
Fill	104,000	cy	\$18	\$ 1,872,000
SUBTOTAL				\$ 7,602,000
Contingency	25%			<u>1,901,000</u>
TOTAL COST OF CONSTRUCTION				\$ 9,503,000
Engineering & Design				365,000
Supervision & Administration				<u>365,000</u>
TOTAL FIRST COST				\$10,233,000
INTEREST DURING CONSTRUCTION (9 MONTHS)				
(((\$10,233,000 / 9 * 9.2631 - \$10,233,000)				<u>299,000</u>
TOTAL INVESTMENT				\$10,532,000
Aids to Navigation (Tower and Beacon)				<u>14,000</u>
TOTAL COST				\$10,546,000
				=====

(1) The unit costs include overhead and profit.

(2) January 1988 price levels



CELLULAR SHEETPILE BREAKWATER DESIGN

NEW LONDON HARBOR
NEW LONDON, CONNECTICUT

FIGURE 4B

TABLE 2

NEW LONDON HARBOR

CELLULAR SHEETPILE BREAKWATER DESIGN ESTIMATES

COST ESTIMATES

<u>ITEM</u>	<u>QUANTITY</u>	<u>UNITS</u>	<u>UNIT PRICE(1)</u>	<u>TOTAL COST(2)</u>
Sheeting	188,900	1f	\$20.00	\$ 3,778,000
Fabricated Sheetting	4,000	1f	\$94.00	376,000
Coating	140,600	sf	\$4.90	689,000
Cell Fill	87,700	cy	\$20.50	1,798,000
Stone Cap	6,300	cy	\$55.00	346,000
Pile Driving	192,900	1f	\$10.00	1,929,000
Dredging Within Cells	27,200	cy	\$19.00	517,000
SUBTOTAL				\$ 9,433,000
Contingency	25%			<u>2,358,000</u>
TOTAL COST OF CONSTRUCTION				\$11,791,000
Engineering & Design				428,000
Supervision & Administration				<u>428,000</u>
TOTAL FIRST COST				\$12,647,000
INTEREST DURING CONSTRUCTION (9 MONTHS)				
(((\$12,647,000 / 9 * 9.2631) - \$12,647,000)				<u>370,000</u>
TOTAL INVESTMENT				\$13,017,000
Aids to Navigation (Tower and Beacon)				<u>14,000</u>
TOTAL COST				\$13,031,000 =====

(1) The unit costs include mob/demob, contractor overhead and profit.

(2) January 1988 price levels.

TABLE 3
NEW LONDON HARBOR
BREAKWATER DESIGNS
ANNUAL COSTS

RUBBLE-MOUND DESIGN

Interest and Amortization $\$10,546,000 \times 0.08765 =$	\$ 924,400
Breakwater Maintenance (1)	23,800
Maintenance of Navigation Aids	<u>1,000</u>
TOTAL	\$ 949,200
SAY	\$ 949,000

CELLULAR SHEETPILE DESIGN

Interest and Amortization $\$13,031,000 \times 0.08765 =$	\$1,142,200
Breakwater Maintenance (1)	29,500
Maintenance of Navigation Aids	<u>1,000</u>
TOTAL	\$1,172,700
SAY	\$1,173,000

(1) The annual maintenance cost is estimated to be 1/4 % of the total first cost.

Benefits were derived from the existing commercial fleet of 3 fishing boats at City Pier, 1 Ferry at Fisher's Island Ferry Pier, and 2 tugs and a Coast Guard vessel at the Coast Guard Pier, as well as, the existing recreational fleet - 25 boats docked at City Pier. In addition, benefits were calculated for the 460 recreational boats that will exist at the proposed marina. Benefits were not derived for the future commercial fleet at the aforementioned marina since it is not conclusive that any commercial vessels would transfer to this marina from another site.

Annual benefits, as detailed in the Economic appendix, are summarized as follows:

COMMERCIAL BENEFITS

FERRY RELATED:	\$61,000	
TUGS:	\$46,500	
COAST GUARD:	\$ 1,400	
FISHING FLEET:	\$27,000	
FUTURE:	CANNOT BE DETERMINED	
TOTAL COMMERCIAL	<u>\$135,900</u>	(68.4%)

RECREATIONAL BENEFITS

EXISTING:	\$ 3,900	
FUTURE:	\$59,000	
TOTAL RECREATIONAL	<u>\$ 62,900</u>	(31.6%)
TOTAL BENEFITS/COMMERCIAL AND RECREATIONAL:	<u>\$198,800</u>	
	SAY	\$199,000

Benefit Cost Analysis

Based on least cost, the rubble-mound breakwater alternative was chosen for analysis. The benefit cost analysis is shown below:

Annual Benefit	\$199,000
Annual Cost	\$949,000
Benefit-Cost Ratio	0.21
Net Benefit	NONE

Conclusions

The annual benefits of the considered breakwater improvement do not outweigh the annual costs. While the project is engineeringly feasible and significant environmental impacts were not identified, the lack of economic justification precludes further Federal involvement under Section 107 authority.

Recommendation

Further study of breakwater improvements for navigation in the area of New London Harbor between Shaw's Cove and City Pier is not recommended.

RECONNAISSANCE REPORT

PROPOSED BREAKWATER CONSTRUCTION

NEW LONDON HARBOR

NEW LONDON, CONNECTICUT

ECONOMIC ANALYSIS

Prepared by:

Matthew Keefe

Regional Economist

February 1988

ECONOMIC AND RESOURCE ANALYSIS SECTION

IMPACT ANALYSIS BRANCH

U.S. ARMY CORPS OF ENGINEERS

NEW ENGLAND DIVISION

NEW LONDON - PROPOSED BREAKWATER STUDY

The purpose of this study is to identify the impacts of a breakwater on damages to commercial and recreational vessels caused by wave action from storms and channel traffic in New London Harbor. The construction of a breakwater was proposed for the area north of Shaws Cove to the area just south of City Pier. This proposed project would provide protection to both commercial and recreational vessels berthed at City Pier, as well as other sites, and facilitate the development of additional moorings behind the breakwater. Benefits are derived from two sources 1) commercial vessels - fishing, ferries, tugs, and a Coast Guard vessel and 2) recreational vessels - pleasure craft. These benefits are derived from reducing damages to boats while docked at shore. Additional benefits from reduced fuel and labor costs caused by unloading delays and movement of vessels upriver during storms are also claimed.

All benefits and costs are stated in October 1987 prices. Benefits and costs are converted to their present value equivalent based on the federal interest rate of 8 5/8%.

STUDY AREA

New London Harbor is a major naval harbor servicing the Groton Nuclear Submarine Center of the United States Navy. The channel servicing this harbor is continuously dredged for National Defense purposes. Opposite the Groton Naval Center, the New London Piers, which berth commercial and recreational vessels, remain unprotected from southerly wave surges during storms. These moored vessels are often times damaged by large wakes from Navy Tugs and other commercial vessels which speed through the channel. South of City Pier is most vulnerable to wave surges from both ship's wakes and storms which cause damage to moored and anchored vessels on the New London side of the river.

At the height of the summer season, the number of vessels in the proposed project area number:

RECREATIONAL	25
COMMERCIAL FISHING	3
FERRY	1
TUGS	2
COAST GUARD	1

WITHOUT PROJECT CONDITION

Vessels which are berthed between the area of Shaw's Cove and City Pier will continue to sustain damages without the construction of a breakwater. Damages in the form of hull chaffing and dock damage will continue under the existing conditions. In addition, commercial vessels will continue to incur higher operating costs due to sustained wave action from both channel traffic and storms. Commercial craft in this study includes the list of vessels above.

WITH PROJECT CONDITION

In addition to reducing damages to vessels both at moorings and in the anchorage areas between Shaws Cove and City Pier, the creation of an additional marina(s), as well as individual moorings, would be feasible with the creation of a breakwater in New London Harbor. This breakwater would provide ample protection to both recreational and commercial vessels. If the proposed breakwater were constructed, it would attract additional commercial fishing vessels as well as recreational craft to the area.

MAIN PROBLEM

The problems in the New London Harbor are damages to commercial and recreational vessels caused by 1) wakes and 2) southeasterly wave surges during storms. Damages to commercial craft led to delays which translate into increased labor and operating costs to firms. During wave surges, fishing vessels remain idle (either out in the channel or at the dock) unable to unload their cargo. This translates into increased labor costs for vessel operators because unloading crews remain idle until the wave surges subside.

In addition to fishing vessels, there are two (2) commercial tugs and one ferry that are affected by wave surges in the project area. Tugs are delayed in changing crews and pumping out. Ferry crews are also delayed in unloading passengers and automobiles when the water gets rough. Table 1 provides an estimated break-down of these annual costs. Costs in the form of delays due to damages can be estimated by determining the average amount of lost revenue for the particular length of time.

COMMERCIAL BENEFITS

Ferry

Benefits for the affected commercial vessels in the project area have been determined in accordance with Economic Principles and Guidelines. In addition to fishing vessels, one ferry has been designated as potentially impacted and was included in the breakwater study. This ferry, which is owned and operated by Fisher Island Ferry Company, has sustained damages to both the vessel and its docking facilities in excess of \$9,000 per year (see Table 1). This vessel also incurs additional labor and fuel costs due to wakes from other commercial vessels in the channel and from southeasterly wave surges. Delays due to these events cost the operator over \$51,000 per year in additional fuel and labor costs. Total costs to this operator were nearly \$61,000 per year. With the construction of a breakwater, damages to the ferry itself would be reduced 90%. Estimated labor and fuel costs would also be expected to decline.

Tugs

Other commercial benefits in the project area include two tugs. Much of the benefits derived from these two vessels are concentrated in the labor cost associated with unloading delays. Tugs, with an average crew of eight (8) men and an average hourly wage of \$11.17 per hour, represent lost revenue to the operator of

TABLE 1
CALCULATION OF ANNUAL DAMAGES
TO COMMERCIAL VESSELS

FERRY CALCULATIONS

There is one ferry in the affected project area. This ship, which is owned and operated by Fisher's Island Ferry Company, sustains damages on an annual basis and on rare occasions (example Hurricane Gloria)

Ferry

length = 132 feet
draft = 5-6 feet
crew = 22 men

ANNUAL DAMAGE ESTIMATION = \$700-\$800/year (replacement of cleats, hull chaffing, and other damages)

DAMAGE TO DOCK = \$8,700 - \$8,800/year

DAMAGES DUE TO WAVE ACTION:

FERRY		DAMAGE/VESSEL/YEAR	% DAMAGES PREVENTED	TOTAL
1	*	\$750	* 0.90	= \$675

DAMAGES TO DOCKS: \$8,700

TOTAL DAMAGES:

WAVE ACTION: \$675.00
DOCK DAMAGE: \$8,700.00
TOTAL: \$9,375.00

WITHOUT PROJECT COSTS

LABOR SAVINGS

1) OFF LOADING DELAYS

FERRY		CREW		TIMES/YR/BOAT		HOURLY RATE	TOTAL
1	*	22	*	208	*	\$11.17	= \$51,113.94

TIMES/YR/BOAT		HRS/DELAY		DELAY/WEEK		WEEKS/YEAR
208	=	2	*	2	*	52

FUEL SAVINGS

1) OFF LOADING DELAYS

FERRY		GAL/HOUR (IDLE)		TIMES/YR/BOAT		\$/GAL	TOTAL	
1	*	2	*	208	*	\$1.20	= \$499.20	SAY \$500

TOTAL FUEL AND LABOR SAVINGS:

LABOR SAVINGS: \$51,114
FUEL SAVINGS: \$500
TOTAL \$51,614

TOTAL BENEFIT FROM ONE FERRY:

ESTIMATED DAMAGES TO SHIP AND DOCK: \$9,375

LABOR AND FUEL SAVINGS DUE TO WAVE

ACTION - UNLOADING DELAYS: \$51,614

TOTAL: \$60,989

SAY: \$61,000

over \$37,000 per year. In addition, fuel costs are approximately \$8,000 per year due to delays. Damages to tugs were around \$750 per vessel per year. The total annual damages to these commercial vessels combined was about \$46,500 (see Table 2).

Coast Guard

Damages to the Coast Guard vessel were minimal compared to tugs, ferries, and fishing vessels in the area. According to the Coast Guard, the largest amount of damages sustained was to the docks. Damage to the docks was approximately \$1,500 per year. Replacement of cleats, wore ropes, and dock bumpers were the usual damages incurred by persistent wave surges. The Coast Guard vessel was subject to intense wave action due to its unprotected location in the harbor. Construction of the proposed breakwater would reduce damages by 90%. The benefits would be \$1,350 if the proposed project were to be implemented.

WITHOUT PROJECT CONDITION FLEET

COMMERCIAL FISHING VESSELS - EXISTING

The commercial fishing fleet is comprised of three (3) charter fishing vessels. Benefits derived from this study include labor and fuel savings that would be realized if the project were implemented. Additional benefits, in the form of damages, were estimated on a per year basis for affected vessels in the project area. The summation of these benefits for the existing fleet was calculated in Table 3. Fuel savings were over \$3,000 per year for the existing fishing fleet. Labor savings as a result of project implementation total a little over \$21,700 per year. Wage rates are responsible for the high costs of labor due to delays from wave action. Damages to the three vessels on an average year total \$2,160. Note, these damages are the result of wave surges only. Damages to vessels are usually the result of chaffing both against docks and other vessels at the berths. Existing commercial benefits total approximately \$27,000 per year. Damages to these vessels are lower than damages to tugs and ferries because the fishing boats can be moved up river before a storm and as a result sustain lower dollar damages. Tugs and ferries cannot be moved from their berths due to their size. As a result, they sustain higher dollar damages during southeasterly wave and storm surges.

FUTURE FLEET CONDITIONS

The creation of a breakwater in New London Harbor would make it possible for the creation of an additional marina or marinas behind the proposed project. The harbor master estimated that an additional 460 recreational and 40 commercial moorings and/or slips would be created provided a breakwater were built. It is not expected that 40 commercial fishing vessels transfer to the new marina facilities. Local officials estimate that nine (9) lobster boats might transfer from Greens Harbor (see paragraph ADDITIONAL COMMERCIAL VESSELS). According to 'Economic Principles and Guidelines', any commercial and/or recreational vessels that move to the new marina(s) would be expected to receive more protection than they received at their previous berths. In addition, fuel and labor costs associated with

TABLE 2
CALCULATION OF ANNUAL DAMAGES
TO TUGS

TUGS - There are two tugs in the affected area and are delayed 1) pumping out and 2) changing crews by wave action in the channel.

tugs
crew = 8
number = 2

LABOR SAVINGS - UNLOADING DELAYS

TUGS		CREW		TIME/YR/DELAY		WAGE/HR		TOTAL
2	*	8	*	208	*	\$11.17	=	\$37,174

FUEL SAVINGS

TUGS		CREW		TIME/YR/DELAY		GAL./HR IDLE		\$/GAL	TOTAL
2	*	8	*	208	*	2	*	\$1.20	= \$7,987.2

SAY: \$8,000/YEAR

DAMAGE

TUGS		DAMAGE/VESSEL/YEAR		% DAMAGE PREVENTED		TOTAL
2	*	\$750	*	0.90	=	\$1,350

TOTAL BENEFIT FROM TUGS:

LABOR COSTS:	\$37,174
FUEL COST:	\$ 8,000
DAMAGES:	\$ 1,350

TOTAL: \$46,524

TABLE 3
COMMERCIAL FISHING FLEET
EXISTING FLEET

1) OFF_LOADING_DELAYS

A. Average Delay Time = 2hrs * 2 times/week = 4 hrs/boat/week
B. per year = 4 * 52 (weeks in year) = 208 hrs/year

FUEL SAVINGS

#_boats		times/yr/boat		gal./hour		\$/gal		TOTAL
3	*	208	*	4	*	\$1.20		= \$2,995.20

LABOR SAVINGS

#_boats		times/yr/boat		crew		wage/hr		TOTAL
3	*	208	*	3	*	\$11.17		= \$20,910.24

2) MOVEMENT_OF_SHIPS_DUE_TO_STORMS - 2 PREDICTED EVENTS

FUEL SAVINGS

#_boats		hours traveled		gal./hr		\$/gal		times/yr		TOTAL
3	*	4	*	4	*	\$1.20	*	2		= \$115.20

LABOR SAVINGS

#_boats		hrs/delay		crew		wage/hr		times/yr		TOTAL
3	*	4	*	3	*	\$11.17	*	2		= \$804.24

3) DAMAGES_DUE_TO_WAVEACTION - 4 SMALL UNEXPECTED EVENTS AND DAMAGES SUSTAINED

#_boats		damage/boat		times/yr		% damages prevented		TOTAL
3	*	\$200	*	4	*	0.90		= \$2,160

TOTAL_EXISTING_COMMERCIAL_FISHING_VESSELS_DAMAGES:

OFF LOADING DELAYS:

fuel savings:	\$2,995.20	
labor "	\$20,910.24	\$23,905.44

MOVEMENT DUE TO STORMS:

fuel savings:	\$115.20	
labor saving:	\$804.24	\$919.44

DAMAGES:

\$2,160.00

GRAND TOTAL: \$26,984.88

SAY: \$27,000

either longer or shorter traveling distances from one berth to another with respects to fishing grounds, have to be taken into consideration. It is based on these conditions that benefits for any additional craft, either recreational or commercial, could be accounted for.

ADDITIONAL COMMERCIAL BENEFITS

In addition to the three (3) commercial fishing vessels now in the project area, there are nine (9) potential transfer vessels from Greens Harbor that might relocate within the project area given a breakwater were built. The main reason for their relocation is that the present moorings and slips in Greens Harbor are being replaced by dock-o-miniums. Dock-o-miniums are docking spaces for recreational boats that are sold in conjunction with waterfront condominiums to private interests. Many commercial fishing vessel operators who rent or lease their slips are being removed in favor of these dock-o-minium customers.

The nine (9) fishing vessels are all lobster boats whose fishing grounds are located southeast of Block Island in Long Island Sound. These vessels do not go out much further than three miles from the coastline. As stated previously, these vessels berth at Greens Harbor which is closer to their fishing grounds than the new proposed marine facility just north of Shaws Cove. There are two reasons for the commercial fishing vessels wanting to move from their present berths at Greens Harbor to the new marina(s). First, private interests are moving into Greens Harbor and taking over the slips and moorings by the dock-o-minium method. Second, the new marina(s), which will be built behind the proposed breakwater, will provide additional protection to commercial craft from storms and other wave action from the main channel. In addition to these two main reasons, vessel operators would also benefit from the fact that they would be closer to wholesaler fish centers where they could sell their catches. Being physically closer to their wholesalers, in respects to berths, would reduce the cost of conducting business for the commercial fishermen. This would make the commercial operator more efficient in respects to day-to-day fishing operations.

ANALYSIS OF TRANSFERRING VESSEL BENEFITS

Any efficiency gains in respects to physical proximity to wholesalers will be more than offset by the increased fuel costs incurred by moving from Greens Harbor to the new facility. The new marina(s) is farther from the fishing grounds than Greens Harbor. As a result, the higher fuel costs to these potentially transferring vessels will offset the efficiency gains of being closer to wholesale fish markets.

RECREATIONAL BENEFITS

According to Economics Principles and Guidelines, recreational benefits can be determined using the recreational point value criterion. Table 4 provides the point values assigned to each criteria for both with and without project condition. The estimated recreational benefit, if a breakwater were to be constructed, is \$3,206. These benefits were based on the total recreational fleet

TABLE 4
RECREATIONAL BENEFITS

UNIT DAY VALUE (UDV) Approach to determining recreational benefits for present and future fleet.

RECREATIONAL POINT VALUE COMPUTATION

CRITERIA	WITHOUT PROJECT	WITH PROJECT
1) RECREATIONAL EXPERIENCE	8	11
2) AVAILABILITY OF OPPORTUNITY	3	3
3) CARRYING CAPACITY	5	10
4) ACCESSIBILITY	10	15
5) ENVIRONMENTAL	6	10
	POINTS 32	49
	POINTS VALUE \$2.84	\$3.79

EXISTING FLEET BENEFIT

CONDITION	#_BOATS		#_TRIPS		PASS.		UDV		RECREATIONAL VALUE
WO PROJECT	25	*	45 [^]	*	3	*	\$2.84	=	\$9,585
W PROJECT	25	*	45	*	3	*	\$3.79	=	\$12,791

BENEFIT \$12,791 - \$9,585 = \$3,206

[^] # trips = 18 weekends * 2 days * 0.75 good weather + 18 weekdays = 45 trips

REDUCED DAMAGES

	#_BOATS		DAMAGE/VESSEL		%_DAM_PREVENTED		TOTAL
EXISTING FLEET	25	*	\$30	*	0.90	=	\$675

TOTAL RECREATIONAL BENEFITS

EXISTING FLEET

UDV: \$3,206.00
DAMAGES: \$675.00
TOTAL: \$3,881.00

TOTAL RECREATIONAL BENEFITS: \$3,881.00
(for existing fleet benefits)

of 25 vessels in the New London Harbor. In addition, 45 trip estimate was used as an average yearly usage figure for seasonal recreational craft.

DAMAGES TO VESSELS

Existing Fleet

The damages sustained by the existing fleet average \$30 per vessel per year. These damages were estimated to be about \$750 for the existing recreational fleet. Since the breakwater would reduce the damage by 90%, the total benefit taken for damages from wave surges for the existing fleet is about \$675 per year (see Table 4).

Future Fleet

In addition to existing recreational benefits, future recreational benefits were determined using Recreational Point Value Criterion - Unit Day Value. These benefits were derived from new vessels being moored in the proposed marina(s) behind the proposed breakwater. The table below provides these additional benefits:

FUTURE RECREATIONAL POINT VALUE NEW LONDON HARBOR

CONDITION	#BOATS	#TRIPS	PASS	UDV		RECREATIONAL VALUE
WO PROJECT	460	45	3	\$2.84	=	\$176,364
W PROJECT	460	45	3	\$3.79	=	\$235,359

$$\begin{aligned} \$235,359 - \$176,364 &= \$58,995 \\ \text{SAY: } &\$59,000 \end{aligned}$$

Table 5 provides a summation of both commercial and recreational benefits for the existing, as well as, the future fleet. The benefit/cost analysis is also provided in Table 6.

TABLE 5
SUMMATION OF BENEFITS

COMMERCIAL BENEFITS

FERRY RELATED:	\$61,000	
TUGS:	\$46,524	
COAST GUARD:	\$ 1,350	\$108,874

COMMERCIAL FISHING FLEET

EXISTING:	\$27,000
FUTURE:	CANNOT BE DETERMINED

TOTAL COMMERCIAL	\$135,875
------------------	-----------

RECREATIONAL BENEFITS

EXISTING:	\$ 3,881
FUTURE:	\$59,000

TOTAL RECREATIONAL	\$62,881
--------------------	----------

TOTAL BENEFITS/COMMERCIAL AND RECREATIONAL:	\$198,755
---	-----------

SAY \$199,000

TABLE 6
ECONOMIC SUMMARY

ANNUAL BENEFIT	\$199,000
ANNUAL COST	\$949,000
BENEFITS-COST RATIO	.21
NET BENEFIT	NONE

RECONNAISSANCE REPORT

PROPOSED BREAKWATER CONSTRUCTION

NEW LONDON HARBOR

NEW LONDON, CONNECTICUT

ENVIRONMENTAL CONCERNS

Prepared by:

Terry Fleming

Marine Biologist

November 1987

ENVIRONMENTAL RESOURCE SECTION

IMPACT ANALYSIS BRANCH

U.S. ARMY CORPS OF ENGINEERS

NEW ENGLAND DIVISION

RECONNAISSANCE REPORT FOR NEW LONDON HARBOR, CONNECTICUT

A. Environmental Report

1. Project Location. New London Harbor is located in the tidal estuary of the lower Thames River above Long Island Sound. The Thames River is a broad, navigable tidal estuary extending northward from Long Island Sound 12 miles to the confluence of the Shetucket and Yantick Rivers at Norwich, Connecticut. The drainage area of the rivers covers 1,473 square miles of Eastern Connecticut, South Central Massachusetts and Western Rhode Island. New London Harbor comprises the lower four miles of the river from the New London Bridge to Long Island Sound. The harbor is 1.5 miles wide at the entrance. The main shipping channel is 40 feet deep by 500 feet wide. A 23-foot dredged channel runs from the main harbor channel along the waterfront from Fort Trumbull past Shaw Cove and into Winthrop Cove.

The harbor is well protected from all but southerly storms by numerous islands to the southwest and Fishers Island to the Southeast. The prevailing winds are from the Southwest in the summer and Northwest in the winter. Overall, the Southwest winds are predominant. Storm winds occur from all quadrants but Easterly storms have the greatest effect on navigation. The mean tidal range at New London is 2.6 feet. Tidal currents follow the general direction of the channel and are not usually strong.

2. Project Description. The project under consideration is the construction of a breakwater to protect commercial vessels berthed at City Pier and facilitate the development of additional mooring facilities. The proposed breakwater would be constructed in the available area between the branch channel on the east and the main channel on the west.

3. Environmental Resources. There are no significant wetland resources in New London Harbor as the lands surrounding the project area are intensively developed. The Thames River estuary, however, has a significant fisheries resource and is a productive shellfish resource.

The fisheries resources include winter flounder, white perch, tomcod, bluefish and striped bass (Linda Gunn, CT Marine Fisheries Program). Numerous lobster pots attest to the presence of lobsters in the area. Oysters are harvested commercially from the area near Horton's Cove north of the project area. Hardshell clams (Mercenaria mercenaria) are harvested commercially in the vicinity of the project. These are transplanted to clean relay stations for purification before going to market.

4. Professional Observations. On 20 October 1987, four 0.04 m² Van Veen grabs were taken from locations within the project area (see attached map). The sediments consisted of fine silts and clays, with lots of shell material. The color of the sediments varied from green to black, the black mud had a slight hydrogen sulfide smell.

Table I

<u>Grab #</u>	<u>Depth</u>	<u>Color of Sediment</u>	<u>Apparent Grain Size</u>	<u>H₂S Smell</u>
1	16'	Black	Silt-Clay	Slight
2	20'	Green	Silt-Clay	-
3	20'	Surface-Green Subsurface-Black	Silt	-
4	20'	Mottled Green-Black	Clay	Slight

To evaluate the types of organisms present in the area, the sediments were sieved through a 1.0 mm mesh sieve. The fauna was dominated by deposit feeding bivalves such as Yoldia limatula, Nucula proxima. Also present were Mulinia lateralis and Piter morrhua. The polychaetes Nephtys and Cistenides and a gammarid amphipod were present in the project area. These species are likely to recolonize the disturbed area rapidly.

5. Professional Opinions.

(a) A potential impact associated with the project would be decreased current velocities in the immediate area around the breakwater enhancing deposition of fine sediments locally. This may result in localized shoaling and/or deposition of material into the Federal channels. To assess this impact we would need information on the frequency, magnitude and periodicity of the waves. The City of New London has prepared a wave analysis for the harbor which may provide much of the needed information.

(b) Resuspension of sediments during construction or with any associated dredging may be a problem as the sediments may have high concentration of metals and organics. (ACOE, 1976; 1985)

(c) Should dredging be required, disposal site options would have to be evaluated. The New London Disposal Site currently being studied under the DAMOS Program would be a likely option.

B. Information Sources

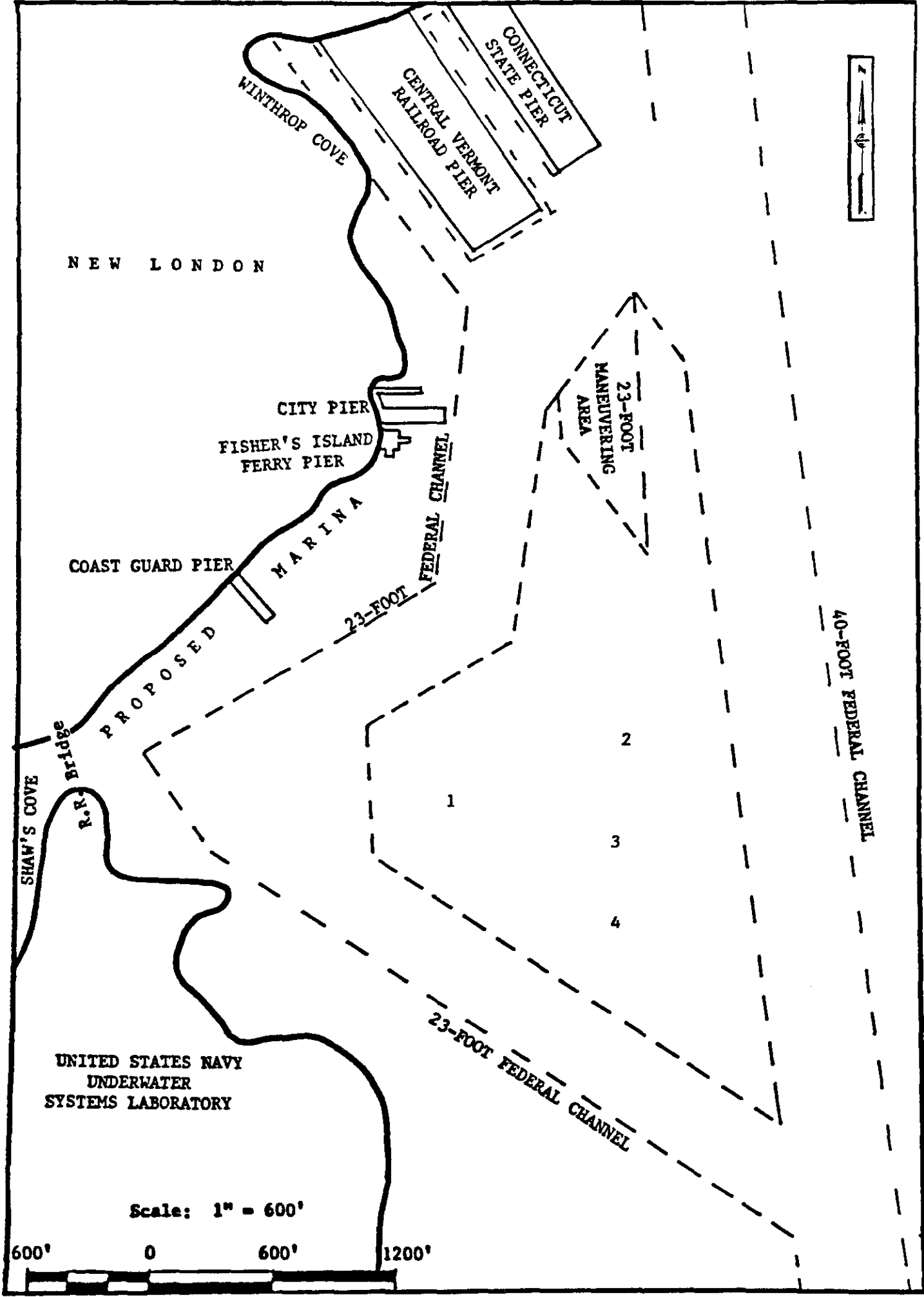
The following information sources have been used and are available for future use in this study.

- (a) Army Corps of Engineers. 1976. Navigation Improvement Project New London Harbor and Thames River, Connecticut - Final EIS
- (b) Army Corps of Engineers. 1976. Revised New London Hurricane Protection Project New London, Connecticut Final EIS
- (c) Army Corps of Engineers. 1984. Sediment characterization New London Disposal site. Disposal Area Monitoring System DAMOS

- (d) Army Corps of Engineers. 1985. Ecological Evaluation of Proposed Oceanic Discharge Material from New London Harbor and Thames River
- (e) Bohler, W.F.; D.F. Condry and J.M. Tramontano. 1979. Suspended Material Distributions in the Wake of Estuarine Channel Dredging Operations. Estuarine and Coastal Shelf Science 9:699-711

The following people have been contacted during the development of this report and should be coordinated with as the study progresses.

Mr. Francis Driscoll, City Manager for New London
Mr. Bruce Hyde, Economic Development for the City of New London
Mr. Tom Eschenfeld, New London Fish Council
Mr. Robert Shire, U.S. Fish and Wildlife Service
Ms. Sue Mello, National Marine Fisheries Service
Mr. John Volk, Aquaculture Division, Dept. of Envir. Mgmt., CT
Ms. Linda Gunn, Marine Fisheries Program, Dept of Envir. Prot., CT



NEW LONDON

CITY PIER
FISHER'S ISLAND
FERRY PIER

COAST GUARD PIER

MARINA

CENTRAL VERMONT
RAILROAD PIER

CONNECTICUT
STATE PIER

23-FOOT
MANEUVERING
AREA

FEDERAL CHANNEL

40-FOOT FEDERAL CHANNEL

23-FOOT FEDERAL CHANNEL

UNITED STATES NAVY
UNDERWATER
SYSTEMS LABORATORY

Scale: 1" = 600'

600' 0 600' 1200'

RECONNAISSANCE REPORT

PROPOSED BREAKWATER CONSTRUCTION

NEW LONDON HARBOR

NEW LONDON, CONNECTICUT

PERTINENT CORRESPONDENCE

April 1988



DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02254-9149

REPLY TO
ATTENTION OF

CENEDPL-CN (1105-2-10)

25 June 1988

MEMORANDUM FOR: Commander, USACE (CECW-P), 20 Mass. Ave., N.W.
Washington, D.C. 20314-1000

SUBJECT: Reconnaissance Report, New London Harbor Connecticut
CWIS No. 87539 (2nd Congressional District)

1. A Reconnaissance Report for the subject project, prepared under the authority of Section 107 of the Rivers and Harbor Act 1960, as amended, has been completed. Federal assistance was requested by the city of New London, in a letter dated 21 May 1985 (copy of letter enclosed).
2. Ten copies of the subject report and Fact Sheet are attached. The report recommends no further study, based on insufficient economic justification. The study sponsor has been informed of our findings (copy of letter enclosed).

FOR THE COMMANDER:

A handwritten signature in dark ink, appearing to read "Thomas A. Rhen", is written over the printed name.

THOMAS A. RHEN
Colonel, Corps of Engineers
Commanding

Enclosure



DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02254-9149

June 25, 1988

REPLY TO
ATTENTION OF

Planning Division
Coastal Development Branch

Mr. C. Francis Driscoll
City Manager
Municipal Bldg.
New London, Connecticut 06320

Dear Mr. Driscoll:

The New England Division has completed its Reconnaissance Study of the proposed inner harbor breakwater in New London Harbor, Connecticut, conducted under the authority of Section 107 of the River and Harbor Act of 1960, as amended. The attached Reconnaissance Report concludes that further Federal study of this project is not warranted due to insufficient economic justification.

The study evaluated the costs and impacts of two breakwater designs, rubble-mound and cellular sheet pile. Both structures were designed to provide full protection from damage caused by waves and wakes of large passing vessels to vessels berthed at downtown waterfront piers. At a cost of about \$10,546,000, the rubble-mound design was the least expensive. However, annual benefits of \$199,000 did not outweigh annual costs of \$949,000.

Should you have any questions concerning our report, please feel free to contact me at (617) 647-8220, or the Project Manager, Mark Habel, of my staff, at (617) 647-8550.

Sincerely,

A handwritten signature in dark ink, appearing to read "Thomas A. Rhen", is written over a horizontal line.

Thomas A. Rhen
Colonel, Corps of Engineers
Division Engineer

NEW LONDON DEVELOPMENT CORPORATION
P.O. Box 88
New London, Connecticut 06320

August 21, 1985

Dirk Zwart, Project Manager
Army Corps of Engineers
424 Trapelo Road
Waltham, MA 02254

Dear Mr. Zwart:

It was indeed a pleasure to meet you on July 30, and to discuss the possibility of the construction of a breakwater at New London Harbor.

This spring I sailed up the Connecticut coast and was amazed by the number of substantial breakwaters which are off the entrances to tiny harbors. New London, which has one of the finest harbors between New York and Boston, has absolutely no refuge for commercial or pleasure vessels. As a boy I witnessed the 1938 hurricane. The shoreline along the New London Harbor in the downtown area was a mass of tangled, sunk fishing and commercial vessels and destroyed piers, in which had once been a thriving center for fishing and commercial maritime use. The remnants of these piers are still visible. I particularly remember viewing the buoy tender "Tulip" lying directly across the railroad tracks and enclose photographs of the same.

Undoubtedly one of the main reasons why New London's maritime industry along the downtown waterfront has diminished and these piers have not been rebuilt is because of the lack of protection from the North, East and the South. The proposed development of this waterfront would also greatly be protected by such a breakwater.

In 1947 I worked on a dragger out of New London, and I can assure you that there is no refuge for such commercial vessels in New London Harbor except for Shaw Cove (now fully utilized for pleasure craft) and for the very small marina at Fort Trumbull (now fully occupied by pleasure craft). That is, a commercial vessel which is working off shore and seeking refuge in a storm would not have any point of refuge in New London Harbor because almost all the protected dock space is occupied.

Dirk Zwart, Project Manager

-2-

August 21, 1985

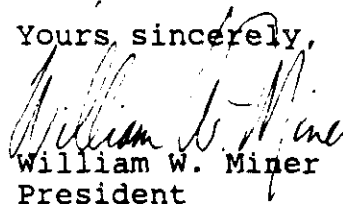
I enclose a copy of a New London Harbor chart on which I have superimposed a suggested location of a breakwater. I am not a professional engineer and this is only a layman's idea of where such a breakwater would be helpful. I feel strongly that almost any breakwater regardless of size would be of substantial benefit to New London's commercial and pleasure traffic, and such a project could be designed with the intent of extending the same at a later date when funds permit.

Lastly, for your information I enclose an article regarding the fishing boat fleet which is proposed to locate in New London. There is no refuge for these vessels and the location at which they would be located is presently completely unprotected from the North and East, the prevailing direction for fall and winter storms. I have marked this location with an "X" on the chart so you can see the site which Seabank Industries, Ltd. is considering. The breakwater would be a wonderful protection for this fishing business and would also provide a refuge for its vessels.

Please let me know if I may be of any assistance in this matter.

With best regards,

Yours, sincerely,


William W. Miner
President

WWM:cgm

Enclosures

Copies: Mayor Jay B. Levin
Richard L. Creviston, Chairman EDAG
C. Francis Driscoll, City Manager



DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02254-9149

REPLY TO
ATTENTION OF

July 1, 1985

Planning Division
Coastal Development Branch

Mr. C. Francis Driscoll, City Manager
City of New London
Municipal Building
181 Captain's Walk
New London, Connecticut 06320

Dear Mr. Driscoll:

I am pleased to inform you that we have initiated a small navigation improvement study for New London, Connecticut in response to your letter dated May 21, 1985.

The first step will involve making an initial appraisal to determine if further study of providing navigation improvements at New London Harbor is warranted. You will be notified of our findings upon completion of the initial appraisal.

Should you have any questions, please contact the Project Manager, Mr. Dirk Zwart, at (617) 647-8553.

Sincerely,

Carl B. Sciple
Colonel, Corps of Engineers
Division Engineer



DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02254-9149

REPLY TO
ATTENTION OF

NEDPL-C

26 June 1985

SUBJECT: Section 107 Initial Appraisal for New London, CT.

CDR USACE (DAEN-CWP-E)
20 Mass. Ave., N.W.
Washington, D.C. 20314-1000

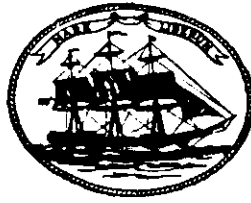
1. We have recently received a request from a municipality asking for the initiation of a small navigation improvement study pursuant to Section 107 of the 1960 River and Harbor Act. The formal request is as follows:

New London, CT - Letter dated 21 May 1985 from the City Manager of New London, requesting improvements to navigation in New London Harbor. A copy of the letter is enclosed.

2. A revolving fund account in the amount of \$7,500 has been set up for the completion of the initial appraisal to determine the need for a full scope Section 107 Reconnaissance and Detailed Project Study. Officials of the affected community are being notified of the establishment of the study fund account and that work will be initiated as soon as capability allows.

CARL B. SCIPLE
Colonel, Corps of Engineers
Commanding

Enclosure



**CITY OF NEW LONDON
CONNECTICUT**

May 21, 1985

Carl B. Sciple
Colonel of Engineers
New England Division, Army Corps of Engineers
424 Trapelo Road
Waltham, Massachusetts 02154

Dear Colonel Sciple:

SUBJECT: Port of New London, Connecticut
Request for Small Navigation Project
per Section 107 of the 1960 Rivers and
Harbors Act as Amended

At the May 20, 1985 New London City Council meeting
it was unanimously voted:

That in accordance with the provisions of Section 107 of
the Rivers and Harbors Act of July 14, 1960, as amended,
the City Council hereby requests the Army Corps of Engineers
to investigate necessary improvements to the Port of New
London.

Very truly yours,

C. Francis Driscoll
City Manager

D:b

cc: Mayor Jay B. Levin
Director of Real Estate
Director of Public Works/City Engineer
Chairman, E.D.A.G.